

C L A I M S

What is claimed is:

1. In an optical module for exposing an image reproduction element comprising:

(1) at least one light source device;

(2) at least one beam forming device optically coupled with said at least one light source device for providing at least one optical beam; and

(3) a heat transfer device thermally coupled with said at least one light source device and said at least one beam forming device;

the improvement wherein the heat transfer device comprises a heat pump.

2. Optical module as recited in Claim 1, wherein the heat pump operates according to a thermo-electric principle.

3. Optical module as recited in Claim 2, wherein the heat pump comprises at least one Peltier element.

4. Optical module as recited in Claim 1, comprising a heat conductive coupling between the heat pump and the device to be heated or cooled.
5. Optical module as recited in Claim 1, wherein the heat transfer device includes a regulating device for regulating the temperature of the device to be heated or cooled.
6. Optical module as recited in Claim 1, wherein components of the heat pump are so distributed throughout the optical module that isothermal areas are realized within the optical module.
7. Optical module as recited in Claim 1, wherein each of said at least one light source device includes its own laser.
8. Optical module as recited in Claim 1, wherein the beam-formation device includes a polygonal mirror.
9. In an optical module for exposing an image reproduction element, comprising:
 - (1) a thermally conductive housing;
 - (2) at least one optical device, capable of being heated and cooled, positioned within, and thermally coupled to said housing;
 - and

(3) a heat transfer device thermally coupled to said housing, whereby said at least one optical device may be indirectly heated or cooled via the housing;

the improvement wherein the heat transfer device comprises a heat pump.

10. Optical module as recited in Claim 9, wherein the heat pump operates according to a thermo-electric principle.

11. Optical module as recited in Claim 10, wherein the heat pump comprises at least one Peltier element.

12. Optical module as recited in Claim 9, comprising a heat conductive coupling between the heat pump and the device to be heated or cooled.

13. Optical module as recited in Claim 9, wherein the heat transfer device includes a regulating device for regulating the temperature of the device to be heated or cooled.

14. Optical module as recited in Claim 9, wherein components of the heat pump are so distributed throughout the optical module that isothermal areas are realized within the optical module.

15. A method for operating an optical module having at least one light source device capable of being heated and cooled, and at least one beam forming device capable of being heated and cooled, in optical contact with the at least one light source device, for exposing an image reproduction element, including the step of jointly transferring heat toward or away from said at least one light source device and said at least one beam forming device, the improvement wherein the said heat transferring step is actively supported by a heat pump.

16. Method as recited in Claim 15, wherein the heat pump device operates according to a thermo-electric principle.

17. Method as recited in Claim 15, wherein the device to be heated or cooled is temporally regulated to a substantially constant temperature.

18. Method as recited in Claim 15, wherein areas of the optical module are maintained isothermally.

19. A method for operating an optical module having a thermally conductive housing and at least one optical device to be heated or cooled, positioned within and thermally coupled to the housing, for exposing an image reproduction element including the step of transferring heat to the housing or away from it so that said at

least one optical device is indirectly heated or cooled by the housing,

wherein said heat transferring step is actively supported by a heat pump.

20. Method as recited in Claim 19, wherein the heat pump device operates according to a thermo-electric principle.

21. Method as recited in Claim 19, wherein the device to be heated or cooled is temporally regulated to a substantially constant temperature.

22. Method as recited in Claim 19, wherein areas of the optical module are maintained isothermally.